APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/608,039	06/30/2003	Sanjay Ghemawat	0026-0030	7559

44989	7590	06/14/2006

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EXAMINER
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ART UNIT	PAPER NUMBER
2161	

DATE MAILED: 06/14/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

	Application No.	Applicant(s)
Office Action Summary	10/608,039	GHEMAWAT ET AL.
	Examiner	Art Unit
	Chelcie Daye	2161

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE <u>3</u> MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on <u>10 March 2006</u>.

2a)☒ This action is **FINAL.**   2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) <u>1-25</u> is/are pending in the application.

    4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) <u>1-25</u> is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

    Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

    Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

    a)☐ All b)☐ Some * c)☐ None of:

      1.☐ Certified copies of the priority documents have been received.

      2.☐ Certified copies of the priority documents have been received in Application No. _____.

      3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

    * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1)☐ Notice of References Cited (PTO-892)

2)☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3)☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.

4)☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .

5)☐ Notice of Informal Patent Application (PTO-152)

6)☐ Other: _____.

DETAILED ACTION

1.   This action is issued in response to applicant's amendment filed on March 10,

2006.

2.   Claims 1-25 are presented. No claims were added and no claims were cancelled.

3.   Claims 1-25 are pending.

4.   Applicant's arguments filed March 10, 2006, have been fully considered but they

are not persuasive.

Claim Rejections - 35 USC § 102

5.   The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that

form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

6.   **Claims 1,2,4-7,10-13, and 20-25 are rejected under 35 U.S.C. 102(b) as being**

anticipated by Mattis (US Patent No. 6,209,003).

        Regarding Claims 1,12, and 13, Mattis discloses a method for deleting

one or more of a plurality of files, the files including one or more chunks stored by

a plurality of servers, the method comprising:

        a master connected to the servers and configured to (column 8, lines 60-

65, Mattis):

identifying a file to be deleted (column 21, lines 59-62, Mattis; wherein fragments are referring to files),

renaming the identified file (column 3, lines 16-19, Mattis);

permanently deleting the renamed file (column 16, lines 48-52, Mattis) a predetermined amount of time after renaming the identified file (column 22, lines 43-47, Mattis) as part of a garbage collection process (Fig.8A, column 21, lines 52-55, Mattis);

receiving, from the servers, information concerning chunks stored by the servers (column 8, lines 16-19, Mattis; wherein keys are referring to chunks); and

identifying, to one of the servers, one of the chunks that corresponds to the permanently deleted file (column 33, lines 32-40, Mattis).

Regarding Claim 2, Mattis discloses a method wherein the identifying a file to be deleted includes:

receiving a deletion instruction regarding the file (column 22, lines 31-35, Mattis).

Regarding Claim 4, Mattis discloses a method wherein the predetermined amount of time is a user-configurable amount of time (column 22, lines 14-23, Mattis).

Regarding Claim 5, Mattis discloses a method wherein the user-configurable amount of time differs for different ones of the files (columns 22-23, lines 65-67 and 1-5, respectively, Mattis).

Regarding Claim 6, Mattis discloses a method wherein metadata is associated with the files (column 25, lines 2-8, Mattis); and wherein the permanently deleting the renamed file (column 16, lines 48-52, Mattis) includes erasing the metadata associated with the renamed file (column 25, lines 12-16, Mattis).

Regarding Claim 7, Mattis discloses a method comprising: deleting, by the one of the servers, the one of the chunks that corresponds to the permanently deleted file (Fig. 9B, columns 35 and 36, lines 65-67 and 1-7, Mattis; wherein the process of modifying is interpreted as changing a file whereas the old file no longer exists, along with the chunks that are associated with the files).

Regarding Claim 10, Mattis discloses a method comprising:
maintaining versions of the chunks (column 17, lines 42-46, Mattis);
identifying a stale chunk based on the versions of the chunks (column 26, lines 15-21, Mattis); and
deleting the stale chunk (column 26, lines 21-22, Mattis).

Regarding Claim 11, Mattis discloses a method wherein metadata is associated with the chunks (column 25, lines 2-8, Mattis); and wherein the deleting the stale chunk (column 26, lines 21-22, Mattis) includes erasing the metadata associated with the stale chunk (column 25, lines 12-16, Mattis).

Regarding Claims 20,22,24,and 25, Mattis discloses method for deleting stale replicas of chunks, the replicas being stored by a plurality of servers, the method comprising:

associating version information with replicas of chunks (column 14, lines 29-37, Mattis);

identifying stale replicas based on the associated version information (column 26, lines 15-21, Mattis);

deleting, by the one of the servers, the one of the replicas that corresponds to one of the stale replicas (column 26, lines 21-22, Mattis);

receiving, from the servers, information concerning replicas stored by the servers (column 8, lines 16-19, Mattis); and

identifying, to one of the servers, one of the replicas that corresponds to one of the deleted stale replicas (column 26, lines 15-21, Mattis).

Regarding Claim 21, Mattis discloses a method wherein the version

information for one of the replicas is updated each time a lease is granted for the

one of the replicas (column 26, lines 8-15, Mattis).

Regarding Claim 23, Mattis discloses a method wherein the deletion of the

stale replicas (column 26, lines 21-22, Mattis) occurs as part of a garbage

collection process (Fig.8A, column 21, lines 52-55, Mattis).

Claim Rejections - 35 USC § 103

7.   The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all

obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

8.   **Claim 3 is rejected under 35 U.S.C. 103(a) as being unpatentable over**

Mattis (US Patent No. 6,209,003) as applied to claims 1,2,4-7,10-13, and 20-25

above, and further in view of Manley (US Patent Publication No. 20030182330).

Regarding Claim 3, Mattis discloses all of the claimed subject matter.

However, Mattis does not explicitly disclose a method comprising:

receiving an un-deletion instruction regarding the file; and

restoring an original name to the file without permanently deleting the

renamed file. On the other hand, Manley discloses a method comprising

receiving an un-deletion instruction regarding the file (pg.13, ¶0132, lines 1-8,

Manley; wherein the rollback procedure performs the instructions of undoing

(which includes un-deleting) changes); and restoring an original name to the file

without permanently deleting the renamed file (pg.7, ¶0067, lines 12-28, Manley).

It would have been obvious to one of ordinary skill in the art at the time of the

invention to incorporate the Manley teachings in the Mattis system. A skilled

artisan would have been motivated to combine in order to protect oneself from

careless errors. For example, if a user deletes a file by unknowingly, having the

option to backtrack and undo the mistake. As a result, this allows the user to

double check the systems actions as well as their own.

9.   **Claims 8-9 and 14-19 are rejected under 35 U.S.C. 103(a) as being**

unpatentable over Mattis (US Patent No. 6,209,003) as applied to claims 1,2,4-7,10-

13, and 20-25 above, and further in view of "New-Value Logging in the Echo

Replicated File System", by Hisgen, Birrell, Jerian, Mann, and Swart, Published

1993; referred to hereinafter as "Hisgen".

Regarding Claim 8, Mattis discloses all of the claimed subject matter.

However, Mattis does not explicitly disclose a method comprising:

identifying an orphaned chunk, including:

providing a mapping of file names to chunks, and

identifying a chunk, as the orphaned chunk, that is not reachable from any

of the file names; and

deleting the orphaned chunk. On the other hand, Hisgen discloses a

method comprising identifying an orphaned chunk (pg.24, ¶3, lines 4-5, Hisgen),

including: providing a mapping of file names to chunks (pg.23, ¶3, lines 1-3,

Hisgen; wherein the Fid map is mapping the file identifiers to the addresses,

which examiner interprets as 'chunks'), and identifying a chunk, as the orphaned

chunk (pg.24, ¶3, lines 4-5, Hisgen), that are not reachable from any of the file

names (pg.24, ¶3, lines 1-4, Hisgen); and deleting the orphaned chunk (pg.24,

¶3, lines 5-8, Hisgen). It would have been obvious to one of ordinary skill in the

art at the time of the invention to incorporate the Hisgen teachings in the Mattis

system. A skilled artisan would have been motivated to combine in order to

recognize and delete information that was no longer accessible within the

system. Getting rid of the orphaned files along with the files that are no longer in

use would save the system time. Instead of the system performing multiple

searches for different files, this permits the system to decrease its workload by

gathering all of the useless data at once. As a result, this allows the system to

allocate needed space for future use.

Regarding Claims 9 and 15, the combination of Mattis in view of Hisgen,

discloses a method wherein metadata is associated with the chunk (column 25,

lines 2-8, Mattis); and wherein the deleting the orphaned chunks (pg.24, ¶3, lines

5-8, Hisgen) includes erasing the metadata associated with the orphaned chunk

(See Fig.1, pg.28, ¶5, lines 1-4, Hisgen).

Regarding Claims 14,16,18 and 19, the combination of Mattis in view of

Hisgen, discloses a method for deleting orphaned chunks of a plurality of chunks

stored by a plurality of servers, the method comprising:

providing a mapping of file names to chunks (pg.23, ¶3, lines 1-3, Hisgen);

identifying chunks, as orphaned chunks (pg.24, ¶3, lines 4-5, Hisgen), that

are not reachable from any of the file names (pg.24, ¶3, lines 1-4, Hisgen);

deleting, by the one of the servers, the one of the chunks that corresponds

to one of the orphaned chunks (pg.24, ¶3, lines 5-8, Hisgen);

receiving, from the servers, information concerning chunks stored by the

servers (column 8, lines 16-19, Mattis); and

identifying, to the one of the servers, one of the chunks that corresponds

to one of the deleted orphaned chunks (pg.24, ¶3, lines 4-5, Hisgen).

Regarding Claim 17, the combination of Mattis in view of Hisgen,

discloses a method wherein the deletion of the orphaned chunks (pg.24, ¶3, lines

5-8, Hisgen) occurs as part of a garbage collection process (Fig. 8A, column 21,

lines 52-55, Mattis).

Response to Arguments

Applicant argues, Mattis does not disclose renaming a file that is identified to be deleted.

Examiner respectfully disagrees. As stated in the action above, Mattis discloses at column 3, lines 16-19, wherein the application has support for renaming files. The Mattis application is a method for garbage collection, which means it is a method for detecting and freeing (i.e. deletion) of unwanted memory. Therefore, since the sole of the invention is to identify space that needs to be deleted, it is common practice that the renaming of files would be assigned to the files, which were identified as being deleted. To further elaborate, Mattis discloses at column 23, lines 15-23, wherein if a fragment is to be deleted, the fragment is marked as deleted, which means that the fragment is an altered fragment that has now been renamed because of the deletion status. As a result, Mattis discloses renaming a file that is identified to be deleted.

Applicant argues, Mattis does not disclose permanently deleting the renamed file a predetermined amount of time after renaming the identified file as part of a garbage collection process.

Examiner respectfully disagrees. The limitation of "permanently deleting a file" has not been entirely disclosed within the specification, since even though a user may mark a file as deleted and proceed to further remove the file, it is known that the

"deleted/removed file" is truly not <u>permanently</u> deleted, because the information is still

within the computer system and if needed, could possibly be retrieved. As stated in the

action above, Mattis discloses at column 16, lines 48-52, wherein the directory is useful

in safeguarding against overwriting and deleting objects currently being read, and the

directory buffers the changes before they are given permanent effect. This means that

the chosen effect (i.e. deleting) is buffered to make sure that is the correct action that

needs to be taken, if so, the effect is made permanent. To further elaborate and better

understand, Mattis discloses at column 32, lines 29-37, wherein the block is set with a

deletion flag indicating that the block will ultimately be deleted. Eventually, the block is

removed from the directory when the changes are reflected, representing the

permanent deletion of the file. Next, Mattis discloses at column 22, lines 39-47, wherein

the fragments are selected for garbage collection, and factors that enhance the

selection of the fragments are the time of the last access; the number of hits; and the

time required to download. These qualifications demonstrate a predetermined amount

of time after renaming. Mattis discloses another example at column 22, lines 14-23,

wherein the high and low water marks need to be at a certain value, and if the water

marks are not at those values the garbage collection is carried out at a time before the

capacity is exceeded. This example not only discloses a predetermined amount of time,

but it also discloses the fact this is all part of a garbage collection process. As a result,

Mattis discloses permanently deleting the renamed file a predetermined amount of time

after renaming the identified file as part of a garbage collection process.

Applicant argues, Mattis does not disclose the newly added limitation, identifying, to one of the servers, one of the chunks that corresponds to the permanently deleted file.

Examiner respectfully disagrees. As stated in the action above, Mattis discloses at column 33, lines 32-40, wherein the proxy contact the server in response to a message to search and identify an object, which therefore corresponds to the act of identifying to one of the servers. Also, as the program searches for the requested object, the server that stores the object using an HTTP request, obtains a copy of the requested object. The requested object is known as being permanently deleted because initially the search receives an error message stating the object does not exist. If the object does not exist it is obvious that the object was permanently deleted. Therefore, Mattis does disclose identifying, to one of the servers, one of the chunks that corresponds to the permanently deleted file.

Applicant argues, Mattis does not disclose that the predetermined amount of time is a user-configurable amount of time.

Examiner respectfully disagrees. As stated in the action above, Mattis discloses at column 22, lines 8-23, wherein the low water mark value is selected to be greater than zero and the high water mark value is chosen to be approximately 20% less than the total storage capacity. The chosen values were assigned within the application

during the programming stages, which is predetermined and done by the user (i.e.

programmer). Therefore, Mattis does disclose the predetermined amount of time is a

user-configurable amount of time.

Applicant argues, Mattis does not disclose identifying and deleting stale replicas

and identifying, to one of the servers, one of the replicas stored by the server that

corresponds to one of the deleted stale replicas.

Examiner respectfully disagrees. As stated in the action above, Mattis discloses

at column 26, lines 15-22, wherein an old object is refreshed in the cache without

retrieving the object from its origin and writing it in the cache, which corresponds to the

identifying of the stale replica, because a stale replica is nothing more than an old

version of a file. Also, Mattis discloses deleting a stale copy of the object, which

corresponds to the deleting of stale replicas. Lastly, Mattis discloses identifying, to one

of the servers, one of the replicas stored by the server that corresponds to one of the

deleted stale replicas has been addressed in the arguments above.

Applicant argues, Mattis nor Manley disclose restoring an original name to a

renamed file without permanently deleting the renamed file.

Examiner respectfully disagrees. As stated in the action above, Mattis in view of

Manley, disclose at ¶0067, lines 12-28, wherein after a file has been modified there is a

pointer to the original file, which contains a link to the node or data. Since there is a

pointer to the original file then the original name must be re-assigned. To further

elaborate, Manley also discloses at ¶0118, lines 1-23, wherein the purgatory directory is

eventually deleted, however the hard link will remain to the entry, ensuring that the

specific entry will not be deleted and the path to the data is maintained. Then every

purgatory entry that becomes associated with a file is similarly hard linked, and thereby

survives deletion of the directory. This means that the file that has been marked to be

deleted was given a hard link to the original file, represented by the specific entry, so

the path to the data remains. Once the file is un-deleted, the file survives deletion and is

given its original name because of the original linkage. As a result, Mattis in view of

Manley, disclose restoring an original name to a renamed file without permanently

deleting the renamed file.

Applicant argues, Mattis nor Hisgen disclose identifying, to one of the servers,

one of the chunks that corresponds to one of the deleted orphaned chunks.

Examiner respectfully disagrees. As stated in the action above, Mattis in view of

Hisgen, disclose at pg.24, ¶3, lines 4-8, wherein the EchoBox can remove the file from

its orphan list and delete the file, which corresponds to the deletion of the orphaned

chunks. Also, the act of identifying, to one of the servers, one of the chunks has been

addressed in the arguments above. Therefore, Mattis in view of Hisgen, disclose

identifying, to one of the servers, one of the chunks that corresponds to one of the

deleted orphaned chunks.

Conclusion

10.   **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time

policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE

MONTHS from the mailing date of this action. In the event a first reply is filed within

TWO MONTHS of the mailing date of this final action and the advisory action is not

mailed until after the end of the THREE-MONTH shortened statutory period, then the

shortened statutory period will expire on the date the advisory action is mailed, and any

extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of

the advisory action. In no event, however, will the statutory period for reply expire later

than SIX MONTHS from the mailing date of this final action.

Points of Contact

Any inquiry concerning this communication or earlier communications from the

examiner should be directed to Chelcie Daye whose telephone number is 571-272-

3891. The examiner can normally be reached on M-F, 7:00 - 4:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's

supervisor, Jeffrey Gaffin can be reached on 571-272-4146. The fax phone number for

the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the

Patent Application Information Retrieval (PAIR) system. Status information for

published applications may be obtained from either Private PAIR or Public PAIR.

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you have questions on access to the Private PAIR system, contact the Electronic

Business Center (EBC) at 866-217-9197 (toll-free).

Chelcie Daye
Patent Examiner
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June 7, 2006

FRANTZ COBY
PRIMARY EXAMINER

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